



Erratum

Corrigendum to “Variation in penaeid shrimp growth rates along an estuarine salinity gradient: Implications for managing river diversions” [J. Exp. Mar. Biol. Ecol. 397 (2011) 196–207]



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The authors regret that we unknowingly used erroneous infauna biomass data in Table 4, and Figs. 7 and 8. We carefully examined these data for accuracy following this discovery and successfully rectified the data for September 2007, but we were unable to verify the veracity of the biomass data for May 2007. Any reference in our paper to the May 2007 infauna biomass data should be disregarded. The results from an analysis of the corrected September biomass data and additional analyses on infauna density data are provided below along with the revised table and figures. The authors would like to apologize for any inconvenience caused.

In addition to the corrected infauna biomass for September, we included data on the density of annelids and crustaceans for both May and September (Table 4). Total prey densities (annelids + crustaceans) also were substituted for biomass in reconstructing Fig. 7. The density of potential prey derived from benthic sediment cores varied among locations in both the May and September experiments (Table 4, Fig. 7).

In May, the densities of annelids and crustaceans were higher at the two saline locations than the two low salinity locations (Intermediate and Brackish). For annelids, this pattern was most pronounced for the shallow treatments resulting in a significant Location \times Treatment interaction. The mean density of crustaceans in May also was higher in mesocosms located along the shore in shallow water than in mesocosms placed away from the marsh in deeper water.

In September, mean densities of annelids and crustaceans were lowest at the Intermediate location, and these densities were significantly lower than at one of the saline locations (Saline UE). There was no significant effect of Location on biomass of infauna. Density and biomass of all infauna were consistently higher at shallow treatments compared

with deeper treatments. Annelid density and crustacean biomass in September also were less in mesocosms randomly selected to receive additional food than in mesocosms identified to receive no additional food.

In place of infauna biomass, we substituted density in Fig. 8 to show the relationship between brown shrimp growth and prey density. There was a statistically significant positive relationship between shrimp growth in biomass and the density of potential prey in the benthic core samples we collected prior to initiating the May experiment. This result, together with our observation that shrimp growth in the low salinity locations was increased by the addition of food, suggests that salinity/location effects on brown shrimp growth were related to prey abundance.

White shrimp held at the Intermediate location grew more slowly than those at other locations, but their growth rates were not related to the biomass or density of infaunal crustaceans and annelids. Growth was unrelated to infauna abundance in our analysis even though densities of these potential prey in September were similar or higher than densities observed in May (Fig. 7) and higher in at least one saline location (Saline UE) than the Intermediate location.

Replacing the incorrect biomass data changed some of the results we reported in the original manuscript. Our conclusions, however, remain essentially unchanged. Our experiments clearly demonstrate that growth rates of brown shrimp and white shrimp are significantly reduced in low-salinity environments. This reduced growth for brown shrimp may be caused both by osmoregulatory costs and indirectly by a reduction in the abundance of their prey (benthic infauna) in areas of low salinity.

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Table 4

Mean density per 58.9 cm² (1 standard error, S.E.) of benthic infauna collected in May and September 2007 among four Locations (Intermediate = INT, Brackish = BRACK, Saline UE = SALU, Saline DE = SALD) and three Treatments (Deep = D, Shallow No Food = SNF, Shallow Food Added = SF). Mean biomass (1 S.E.) as mg dry weight of benthic infauna per 58.9 cm² also is shown for September 2007. Each mean was estimated from 12 and 16 pooled sediment core samples collected prior to initiating shrimp growth experiments in each Location and Treatment, respectively (except May (density): BRACK and INT Locations = 11, SF Treatment = 14; September (density): SALU and SALD = 11, D and SF Treatments = 15). The untransformed density data shown below were transformed [$\ln(x + 1)$] prior to analysis to remove the relationship between the mean and variance present in untransformed data and thereby meet ANOVA assumptions. ANOVA results (p values) are given for the main effects of Location and Treatment along with results from a priori contrasts that compare D vs. SNF and SF vs. SNF treatments. The significant results of Tukey HSD post-hoc tests comparing density or biomass among the four locations also are given.

	Location main effect										Treatment main effect								Contrast p values		Interaction
	Intermediate		Brackish		Saline UE		Saline DE		ANOVA	Post-hoc Comparison	Deep		SNF		SF		ANOVA	D vs. SNF	SNF vs. SF	Location X Treatment	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	p value	Result	Mean	S.E.	Mean	S.E.	Mean	S.E.	p value				
May 2007																					
Annelid density	18.4	(5.61)	14.8	(4.56)	60.3	(11.18)	180.3	(44.66)	0.0001	SALD > SALU > INT = BRACK	32.9	(7.43)	65.8	(16.76)	119.5	(44.37)	0.2135			0.0227	
Crustacean density	21.5	(8.87)	7.8	(2.50)	55.3	(11.06)	97.4	(24.50)	0.0001	SALD = SALU > INT = BRACK	11.2	(2.41)	57.5	(12.73)	75.4	(21.76)	0.0006	0.0003	0.5549	0.1254	
September 2007																					
Annelid density	44.8	(8.30)	133.0	(39.64)	157.5	(43.10)	127.3	(29.78)	0.0059	SALU > INT, SALU = SALD = BRACK, SALD = INT	40.4	(17.93)	189.1	(29.67)	108.9	(26.92)	0.0001	0.0000	0.0162	0.3396	
Crustacean density	30.3	(12.87)	60.3	(38.01)	288.7	(86.60)	114.5	(28.87)	0.0003	SALU > BRACK = INT, SALU = SALD, SALD = BRACK = INT	13.1	(5.40)	233.0	(60.61)	106.7	(38.76)	0.0001	0.0000	0.1124	0.1209	
Annelid biomass	3.7	(1.58)	4.4	(1.08)	5.5	(1.57)	7.5	(3.30)	0.5414		2.0	(0.55)	8.0	(1.45)	5.9	(2.47)	0.0438	0.0141	0.3622	0.2666	
Crustacean biomass	17.4	(13.06)	4.5	(2.42)	14.6	(4.80)	3.3	(1.12)	0.3620		1.1	(0.54)	23.2	(9.81)	5.5	(1.79)	0.0265	0.0111	0.0385	0.6160	

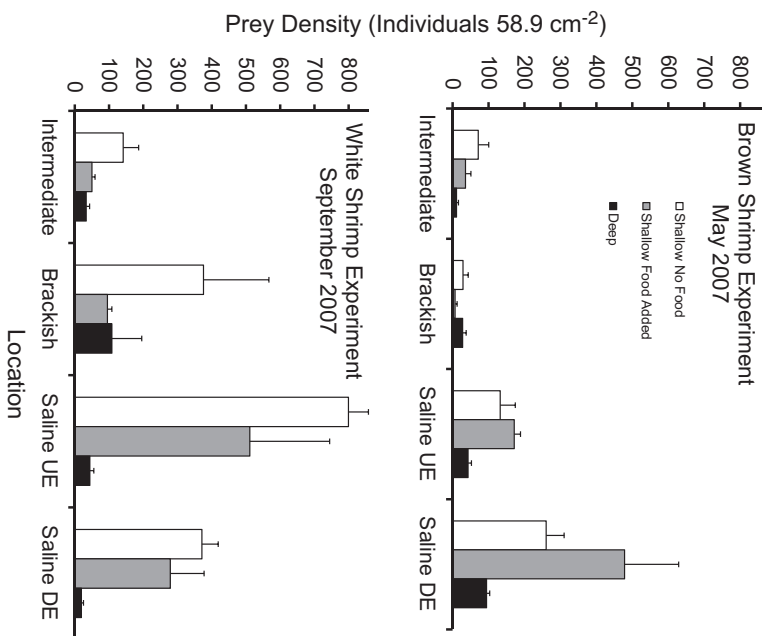


Fig. 7. Comparison of prey (annelids and crustaceans) density (individuals per 58.9 cm²) among the four locations (Intermediate, Brackish, Saline UE = Saline Up Estuary, Saline DE = Saline Down Estuary) and three treatments (Shallow no food, shallow food added, and deep) in the May and September 2007 experiments. Each mean and SE is calculated from four sediment samples (except n = 3 for Intermediate and Brackish/shallow food added in May and Saline UE/Deep and Saline DE/shallow food added in September).

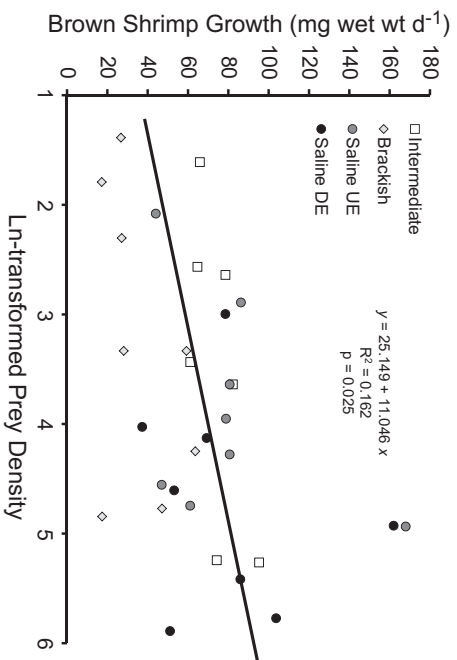


Fig. 8. Relationship between brown shrimp *Farfantepenaeus aztecus* growth rate and the density of potential prey (annelids and crustaceans) collected from sediment cores taken before initiating May 2007 experiment. Prey density data were transformed [$\ln(x + 1)$] as required to meet ANOVA assumptions. Data from mesocosms where food was added are not included.